

CLAIM AMENDMENTS

Claims 1-21 are pending. Claims 14 and 21 are currently amended herein:

1 1. (Original) A multi-sector in-building repeater in communication with a base station, the
2 multi-sector in-building repeater comprising:

3 a master transmitting unit for receiving multi-sector signals of a carrier frequency from the
4 base station, mixing the multi-sector signals with different transmission intermediate frequency
5 signals, and outputting mixed multi-sector signals to a same transmission line;

6 a plurality of slave transmitting units for extracting sector signals assigned to the multi-sector
7 signals from the master transmitting unit, converting extracted sector signals into high frequency
8 signals, and transmitting converted high frequency signals through an antenna;

9 a plurality of slave receiving units for mixing different receiving intermediate frequency
10 signals with the sector signals of carrier frequencies from the antenna, converting mixed signals into
11 multi-sector signals of different receiving intermediate frequency bands, and outputting converted
12 sector signals to a same transmission line;

13 a master receiving unit for mixing multi-sector signals at the plurality of slave receiving
14 units, the multi-sector signals having been transmitted through the same transmission line from the
15 plurality of slave receiving units and converted into different receiving intermediate frequency band
16 signals, with different intermediate frequency band signals, separating each of the sector signals,
17 converting separated sector signals into receiving carrier frequency signals, and outputting converted
18 signals to the base station;

19 a master transmitting/receiving separator for separating transmitted/received signals of the
20 master transmitting unit from transmitted/received signals of the master receiving unit; and

21 a distributor for distributing received multi-sector signals from the master transmitting unit
22 to the plurality of slave receiving units, receiving sector signals being converted into receiving
23 intermediate frequency band signals from the plurality of slave receiving units, and transmitting
24 converted sector signals to the master receiving unit.

1 2. (Original) The repeater according to claim 1, wherein the master transmitting unit
2 comprises:

3 a plurality of mixing units for receiving assigned carrier frequency sector signals from the
4 base station, mixing received sector signals with different transmission intermediate frequency
5 signals, and outputting mixed sector signals; and

6 a plurality of amplifying units for filtering off unnecessary signals output signals of the
7 mixing units, the sector signals having been converted into different transmission intermediate
8 frequency signals, for amplifying the sector signals without the unnecessary signals to a
9 predetermined level, and for outputting amplified signals to a same transmission line.

1 3. (Original) The repeater according to claim 2, wherein each of the mixing units comprises:

2 an attenuator for receiving high frequency sector signals of an assigned carrier frequency
3 from the base station, attenuating received high frequency sector signals, and outputting attenuated
4 high frequency sector signals; and

5 a mixer for mixing the attenuated carrier frequency sector signals at the attenuator with
6 signals having subtracted different transmission intermediate frequency band signals from the carrier
7 frequency, and outputting converted sector signals into the different transmission intermediate
8 frequency band signals to each of the amplifying units.

1 4. (Original) The repeater according to claim 2, wherein each of the amplifying unit
2 comprises:

3 a band-pass filter for filtering off converted sector signals into different transmission
4 intermediate frequency band signals provided from the mixing units; and

5 an amplifier for amplifying filtered sector signals through the band-pass filter to a
6 predetermined level, and outputting amplified sector signals to a transmission line.

1 5. (Original) The repeater according to claim 1, wherein the slave transmitting unit
2 comprises:

3 a sector signal extracting unit for receiving the converted multi-sector signals into different
4 transmission intermediate frequency signals provided from the master transmitting unit, mixing
5 sector signals to be extracted out of the received multi-sector signals with signals having subtracted
6 a predetermined value from the transmission intermediate frequency signals, and extracting sector
7 signals; and

8 a high frequency signal generating unit for converting extracted sector signals at the sector
9 signal extracting unit into high frequency signals, and transmitting converted signals through an

10 antenna.

1 6. (Original) The repeater according to claim 5, wherein the sector signal extracting unit
2 comprises:

3 a first band-pass filter for filtering off multi-sector signals having been converted to different
4 transmission intermediate frequency signals provided from the master transmitting unit;

5 a mixer for receiving filtered multi-sector signals from the first band-pass filter, mixing
6 sector signals to be extracted out of the multi-sector signals with signals having subtracted a
7 predetermined value from mixed transmission intermediate frequency signals, and outputting mixed
8 signals; and

9 a second band-pass filter for filtering off output signals of the mixer, and extracting a desired
10 sector signal.

1 7. (Original) The repeater according to claim 5, wherein the high frequency signal generating
2 unit comprises:

3 a high frequency generator for generating high frequency signals by mixing sector signals
4 extracted through the sector signal extracting unit with signals having subtracted a predetermined
5 value from the base station carrier frequency; and

6 a power amplifier for amplifying power of the high frequency signals provided by the high
7 frequency generator, and transmitting amplified signals through an antenna.

1 8. (Original) The repeater according to claim 1, wherein the slave receiving unit comprises:
2 an intermediate frequency generating unit for generating intermediate frequency signals by
3 mixing receive carrier frequency sector signals provided through the antenna with assigned receive
4 intermediate frequency signals; and
5 an amplifier for filtering off intermediate frequency signals generated by the intermediate
6 frequency generating unit, and amplifying filtered intermediate frequency signals to a predetermined
7 level.

1 9. (Original) The repeater according to claim 8, wherein the intermediate frequency
2 generating unit comprises:
3 an amplifier for amplifying receive carrier frequency sector signals provided through the
4 antenna to a predetermined level;
5 a band-pass filter for filtering the receive carrier frequency sector signals being amplified by
6 the amplifier; and
7 a mixer for mixing filtered receive carrier frequency sector signals provided from the
8 band-pass filter with signals having subtracted intermediate frequency signals from a receive carrier
9 frequency.

1 10. (Original) The repeater according to claim 8, wherein the amplifying unit comprises:
2 an amplifier for amplifying intermediate frequency band sector signals provided by the
3 intermediate frequency generating unit to a predetermined level; and

4 a band-pass filter for filtering off amplified intermediate frequency band sector signals from
5 the amplifier, and transmitting filtered signals to the master receiving unit.

1 11. (Original) The repeater according to claim 1, wherein the master receiving unit
2 comprises:

3 a plurality of sector signal separating units for receiving converted multi-sector signals into
4 different receive intermediate frequency band signals provided from the plurality of slave receiving
5 units, mixing sector signals to be extracted with signals having subtracted a predetermined value
6 from mixed receive intermediate frequency signals, and separating the sector signals to be extracted;
7 and

8 a plurality of high frequency generating units for receiving separated sector signals from the
9 sector signal separating unit, mixing the separated sector signals with signals having subtracted a
10 predetermined value from a receive carrier frequency, converting receive intermediate frequency
11 band signals to receive carrier frequency band signals, and outputting converted signals to the base
12 station.

1 12. (Original) The repeater according to claim 11, wherein the sector signal separating unit
2 comprises:

3 a mixer for receiving converted multi-sector signals into different receive intermediate
4 frequency band signals provided from the plurality of slave receiving units, for mixing sector signals
5 to be extracted with signals having subtracted a predetermined value from mixed receive

6 intermediate frequency signals, and outputting mixed signals; and

7 a band-pass filter for receiving the mixed signals from the mixer, performing band-pass
8 filtering around the predetermined value, and separating the sector signals to be extracted.

1 13. (Original) The repeater according to claim 11, wherein the high frequency generating
2 unit comprises:

3 a mixer for receiving separated sector signals from the sector signal separating unit, mixing
4 the sector signals with frequency signals having subtracted a predetermined value from a receive
5 carrier frequency, converting receive intermediate frequency band signals to receive carrier frequency
6 band signals, and outputting converted signals; and

7 an amplifier for amplifying the receive carrier frequency band signals output from the mixer
8 to a predetermined level.

1 14. (Currently Amended) Apparatus for transmitting sector ~~signal~~ signals in a multi-sector
2 in-building repeater, the apparatus comprising:

3 a master transmitting unit for receiving multi-sector signals of a carrier frequency from
4 [[the]] a base station, mixing the multi-sector signals with different transmission intermediate
5 frequency signals, and outputting mixed multi-sector signals to a same transmission line;

6 a plurality of slave transmitting units for extracting sector signals assigned to the multi-sector
7 signals from the master transmitting unit, converting extracted sector signals into high frequency
8 signals, and transmitting converted high frequency signals through an antenna.

1 15. (Original) The apparatus according to claim 14, wherein the master transmitting unit
2 comprises:

3 a plurality of mixing units for receiving assigned carrier frequency sector signals from the
4 base station, mixing received sector signals with different transmission intermediate frequency
5 signals, and outputting mixed sector signals; and

6 a plurality of amplifying units for filtering off unnecessary signals output signals of the
7 mixing units, the sector signals having been converted into different transmission intermediate
8 frequency signals, for amplifying the sector signals without the unnecessary signals to a
9 predetermined level, and for outputting amplified signals to a same transmission line.

1 16. (Original) The apparatus according to claim 15, wherein each of the mixing units
2 comprises:

3 an attenuator for receiving high frequency sector signals of an assigned carrier frequency
4 from the base station, attenuating received high frequency sector signals, and outputting attenuated
5 high frequency sector signals; and

6 a mixer for mixing the attenuated carrier frequency sector signals at the attenuator with
7 signals having subtracted different transmission intermediate frequency band signals from the carrier
8 frequency, and outputting converted sector signals into the different transmission intermediate
9 frequency band signals to each of the amplifying units.

1 17. (Original) Apparatus for receiving sector signal in multi-sector in-building repeater , the
2 apparatus comprising:

3 a plurality of slave receiving units for mixing different receiving intermediate frequency
4 signals with the sector signals of carrier frequencies from the antenna, converting mixed signals into
5 multi-sector signals of different receiving intermediate frequency bands, and outputting converted
6 sector signals to a same transmission line;

7 a master receiving unit for mixing multi-sector signals at the plurality of slave receiving
8 units, the multi-sector signals having been transmitted through the same transmission line from the
9 plurality of slave receiving units and converted into different receiving intermediate frequency band
10 signals, with different intermediate frequency band signals, separating each of the sector signals,
11 converting separated sector signals into receiving carrier frequency signals, and outputting converted
12 signals to the base station;

13 a distributor for distributing received multi-sector signals to the plurality of slave receiving
14 units, receiving sector signals being converted into receiving intermediate frequency band signals
15 from the plurality of slave receiving units, and transmitting converted sector signals to the master
16 receiving unit.

1 18. (Original) The apparatus according to claim 17, wherein the slave receiving unit
2 comprises:

3 an intermediate frequency generating unit for generating intermediate frequency signals by
4 mixing receive carrier frequency sector signals provided through the antenna with assigned receive

intermediate frequency signals; and

an amplifier for filtering off intermediate frequency signals generated by the intermediate frequency generating unit, and amplifying filtered intermediate frequency signals to a predetermined level.

19. (Original) The apparatus according to claim 18, wherein the intermediate frequency generating unit comprises:

an amplifier for amplifying receive carrier frequency sector signals provided through the antenna to a predetermined level;

a band-pass filter for filtering the receive carrier frequency sector signals being amplified by the amplifier; and

a mixer for mixing filtered receive carrier frequency sector signals provided from the band-pass filter with signals having subtracted intermediate frequency signals from a receive carrier frequency.

20. (Original) A method of providing signals from a base station to multiple sectors in a building utilizing a multi-sector in-building repeater, comprising:

attenuating and amplifying a plurality of sector signals of a carrier frequency received from the base station;

mixing each of the attenuated and amplified sector signals with corresponding different transmission intermediate frequency signals, and outputting each of the mixed sector signals to a

7 same transmission line via a first duplexer;

8 distributing the mixed sector signals of the same transmission line to a plurality of slave
9 transmitting units disposed at respective ones of the multiple sectors;

10 extracting sector signals in each of the multiple sectors by utilizing different intermediate
11 frequency signals assigned to respective ones of the slave transmitting units;

12 converting the extracted sector signals into high frequency signals, and transmitting the
13 converted high frequency signals via a second duplexer through respective antennas, disposed within
14 each of the multiple sectors.

1 21. (Currently Amended) The method as set forth in claim [[14]] 20, further comprising:

2 generating, in each of a plurality of slave receiving units, intermediate frequency signals by
3 mixing receive carrier frequency sector signals provided through the antenna and the second
4 duplexer, with assigned receive intermediate frequency signals;

5 outputting the intermediate frequency signals of each slave receiving unit to said first
6 duplexer via said same transmission line;

7 converting the intermediate frequency signals of each slave receiving unit, output by the first
8 duplexer, to different carrier frequency signals for transmission to said base station.